DYNAMICS OF PLAYA LAKES IN THE TEXAS HIGH PLAINS

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A) Title - DYNAMICS OF PLAYA LAKES IN THE TEXAS HIGH PLAINS (342-C)

B) P.I. Identification Number - UN 168

C) Problems - The playa surface of the Double Lakes test site, because of unusual rains, still contains water, thus no control has been secured from that area. However, rapid evaporation suggests that the playa should be dry enough for coring in the next report period.

Conversion of the University IBM 360 computer to an IBM 370, and attendant problems, has caused a delay in combining CCT printouts with MSS transparencies of the test sites. Preliminary study of CCT printouts supplied by LARS does, however, show registration problems when compared to standard 7 1/2' quadrangles.

D) Accomplishments - During the last report period the Double Lakes test site was drilled to determine the morphology of the lake basin and to investigate the extent of sediments which have neutron probes inserted for soil moisture studies. A total of 384 man/hours was spent in drilling a total of 1069 feet in 23 drill holes. The hydraulic drilling rig and one man were loaned to the project by the local Soil Conservation Service (Department

of Agriculture), Geomorphology of the Southern High Plains Work Unit.

Climatic data continues to be collected from both test sites (Double Lakes and T-Bar), returns being particularly good this last report period because of several climatic events.

In order to allow correlation of optical analysis of MSS transparencies with CCT printouts, a computer program has been written for the reconstitution of the CCT's over the test site scenes, however, no results are as yet available.

Instrumentation has been increased with the addition of 16 more colors and a density control unit (DCU) to the density slicer. The DCU allows quantitative density readings at any spot on the transparencies as well as providing a density profile along the Y axis.

Stanford Research Institute personnel, using ERTS MSS scenes from the Fall of 1972, completed a wet lake census over the Southern High Plains, West Texas and eastern New Mexico. Although scenes from adjacent passes could not be used due to cloud cover, alternate scenes revealed at least 10,036 water-filled lake basins: about 50% of the total. These basins contained at least 182,561 acre/feet of available fresh water and perhaps

as much as 580,098 acre/feet. The wet lake census from the corresponding MSS scenes by CCT printouts has not, as yet, been completed.

E) Relationship of Significant Results to Practical Applications -

One of the unknown entities for the conservation and development of intermittent surface water supplies in semi-arid to arid areas of the world is an approximation of the volume of such water in the playa lake basins which characterize such areas. There had been, previous to ERTS-1 imagery, no practical way to accurately determine how many lake basins contain water at any one time over large geographic areas such as West Texas-Eastern New Mexico, South Africa, or Australia. It was simply impossible, from monetary, manpower and time considerations, to take a regional wet census over areas of tens of thousands of square miles when lake basin intensity may average 2.5 per square mile. However, the first available ERTS-1 imagery showed that synoptic satellite views, particularly from the near infrared part of the spectrum, could be utilized for such a census.

It is of significance that the Principal Investigator has been invited by the Panhandle Regional Planning Commission to submit a proposal for the monitoring of intermittent lake basins of West Texas utilizing ERTS imagery.

F) NA

G) Recommendations Concerning Additional Investigative Effort, Etc. - Preliminary studies illustrate that significant correlation does exist between film density and water depth in the lake basins. This aspect needs additional investigative effort, particularly to study water quality, turbidity, and wave action at the time of overpasses.

The difficulties in registration between the CCT printouts and 7 1/2' quadrangles needs to be resolved.

H) NA

I) ERTS Image Descriptor Forms (see next page)

J) NA

ERTS IMAGE DESCRIPTOR FORM

(See Instructions on Back)

NDPF USE ONLY
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N
ID

DATE May 31, 1973

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GSFC UN 168

ORGANIZATION Texas Tech University

PRODUCT ID (INCLUDE BAND AND PRODUCT)	FREQUENTLY USED DESCRIPTORS* Playa Lake	Hydrology	Wet Lake Census	DESCRIPTORS
100616522A	✓	✓	✓	Water-filled lakes

*FOR DESCRIPTORS WHICH WILL OCCUR FREQUENTLY, WRITE THE DESCRIPTOR TERMS IN THESE COLUMN HEADING SPACES NOW AND USE A CHECK (✓) MARK IN THE APPROPRIATE PRODUCT ID LINES. (FOR OTHER DESCRIPTORS, WRITE THE TERM UNDER THE DESCRIPTORS COLUMN).

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